Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

THz generation by ultra-short laser pulses propagating in nonuniform plasma channels[1] T. ANTONSEN, J. PALASTRO, IREAP, University of Maryland, J. COOLEY, Los Alamos Laboratory, A. YORK, S. VARMA, H. MILCHBERG, IPST, University of Maryland — We consider the excitation of THz electromagnetic waves inn plasma by the ponderomotive force of an ultra-short laser pulse. For a uniform plasma such excitation is weak because electromagnetic waves have no density perturbation and do not couple to the ponderomotively driven plasma current. EM waves in a nonuniform plasma channel can be excited. Further, if the channel is axially modulated the EM waves can be slowed down and phase matched to the ponderomotive wave. We calculate the excitation of these waves by both fixed shape laser pulses and by parametric decay. Experimental techniques for generating modulated channels are also explored.

[1]Supported by NSF and US DoE

Thomas Antonsen
University of Maryland

Date submitted: 22 Jul 2005 Electronic form version 1.4